December 11, 1956

Dr. Allyn H. Seymour
Marine Biologist
Division of Biology and Medicine
United States Atomic Energy Commission
Washington, D. C.

Dear Dr. Seymour:

In rechecking the items listed in your letter of December 4 which require a reply I find two that have not been covered.

As copies of reports by the Applied Fisheries Laboratory are always forwarded by us to the Washington office immediately after they are completed, I am surprised that copies of UWFL-34, 35, 38 and 39 are not available in your office.

UWFL-34 "Work in progress and planned for the fiscal year 1954 at the Applied Fisheries Laboratory, University of Washington".

Four copies of this report were mailed to Kenneth Englund on July 13, 1953, with a request that after his review two copies be forwarded to Washington.

UWFL-35 "Preliminary statement of the proposed program for Marine Survey Unit, Section 19".

Copy 5 of this report was mailed to Dr. Pearson on September 1, 1953.

UWFL-38 "Some effects of x-irradiation of different embryonic stages of the trout (Salmo gairdnerii)". GROWTH, Vol. 18, pp. 227-255, 1954.

UWFL number assigned to paper before publication.

UWFL-39 "Sensitivity to X-rays of the early cleavage stages of the snail Helisoma subcrenatum". GROWTH, Vol. 19, pp. 9-18, 1955.

UWFL number assigned to paper before publication.

2. - Dr. Allyn Seymour from Dr. Donaldson, December 11, 1956.

Additional copies of all available UWFL reports and reprints were sent to the Division of Biology and Medicine in January 1956.

Copies or reprints of the four papers listed above are being forwarded under separate cover.

In response to your request for new findings or ideas about radiation in Coenobita, Ed has written the enclosed notes which may be useful to you and Dr. Dunning.

Thanks for clearing up our financial problems. As soon as Mr. Englund makes the money available we can settle all the Marsh equipment accounts.

Sincerely yours,

Lauren R. Donaldson
Director

LRD:mc
Encl.
cc: Mr. Kenneth Englund

Applied Fisheries Laboratory
University of Washington
Seattle 5, Washington
December 11, 1956

Comments on Sr^{90} in Land Crabs re.: Dr. Seymour's letter of December 4, 1956:

The Sr^{90} levels in land crabs can be expected to remain constant (excepting physical decay) over a period of years. This statement is based on the data resulting from repeated collections at Belle Island, Eniwetok, during a period of two years following Nectar test.

The radioactivity in the carapace (exoskeleton) due to long lived isotopes remained approximately constant at a level of approximately 10,000 d/m/g wet throughout a period of 23 months during which collections were made.

Radiochemical analysis of 15 samples taken at various times during the collecting period, and three samples taken 35 days before Nectar test demonstrated that virtually 100% of the long lived isotopes was Sr^{90} and its Y^{90} daughter.

The land crabs being omnivorous can probably be considered an index of biologically available strontium. However, the ratio of the strontium to that in food items is not known. Judging from the meager data presently available the radio-strontium content of the crab skeleton is more than ten times that in land plants on a wet weight basis and is more than three times that in soil on a dry weight basis.

The data from the Belle Island collections indicates that turnover of strontium in the land crab skeleton is rapid. The

comparatively high levels of Sr^{90} in the carapace probably represent a condition of equilibrium with the available strontium rather than an accumulation over a long period of time.

In muscle of land crabs collected at Belle Island in February and November 1955, and analyzed in January and March of 1956, Cs^{137}, $Sr^{90}+Y^{90}$, and $Ce^{144}+Pr^{144}$ accounted for 84%, 10%, and 1%, respectively, of the total activity. In contrast to the exoskeleton, muscle had a variable, though generally decreasing level of long lived isotopes throughout the post Nectar collecting period at Belle Island. Whether or not Sr^{90} levels in the muscle were decreasing during this period is not known. Although there was a decrease from 90 d/m/g wet in a single specimen collected in February 1955 to 60 d/m/g wet in a specimen collected in November 1955, experience has shown that individual variation may account for such differences. Values of determinations of Sr^{90} in muscle of land crabs from Kabelle Island, Rongelap Atoll, indicate that the Sr^{90} level is remaining constant. But here again individual variation is great: the value for duplicate determinations of muscle from a single coconut crab collected in January 1955 was 59 ± 1.5 d/m/g wet and the average of three samples of hermit crab muscle taken in July 1956 was 59 ± 37 d/m/g wet.

It should be clearly understood that the above discussion applies only to the land crabs and not to marine crabs. Marine crabs have lower levels of total activity than do the land crabs and contain little, if any, Sr^{90} (see for example NRDL-455 Table 3.3).